DUF_6 Depleted Uranium Hexafluoride Conversion Project	DUF6-UDS-U-PLN-075 REVISION 0 June 2007

HF Disposition Plan

Uranium Disposition Services, LLC
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U.S. Department of Energy
Portsmouth Paducah Project Office
Portsmouth Site
Paducah Site

Depleted Uranium Hexafluoride Conversion Project Title

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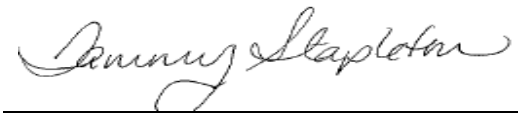

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DISCLAIMER

DUF6 CONVERSION PROJECT
HF Disposition Plan

Revision Summary

TITLE: HF Disposition Plan	DOCUMENT NO: DUF6-UDS-PLN-075	REV: 0
REVISION DESCRIPTION • New Document issued for DOE Review		

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LIST OF ACRONYMS

DOE	Department of Energy
UDS	Uranium Disposition Services, LLC
To Be Completed	

1. INTRODUCTION AND BACKGROUND

1.1 PRODUCT OVERVIEW

The Department of Energy approved the plan and release limits for unrestricted release of hydrofluoric acid produced in the Uranium Disposition Services (UDS) conversion facilities in Portsmouth, Ohio and Paducah, Kentucky. As a result, UDS entered into a sales agreement with Solvay Fluorides to broker the entire production of aqueous hydrofluoric acid (aqHF) in May 2006. This disposition plan provides the roles and responsibilities cited in the sales agreement and details how the transfer and shipment of the product will occur.

In addition, as required by 29 CFR 1910.119, a process safety management (PSM) program must be implemented for aqHF. These requirements are very similar to those required by DOE in establishing a Documented Safety Analysis (DSA) and Technical Safety Requirement (TSRs). However, there are several specific requirements cited in the regulations that are not as specific in the DSAs and TSRs. While the DSA and TSRs provide the basis for the PSM, this plan details the PSM program as an all inclusive document.

1.2 ALARA STUDY

DUF6-G-Q-STU-001, *ALARA Analysis - Supporting Approval of Authorized Limits for Unrestricted Release of Hydrogen Fluoride and Calcium Fluoride During DUF6 Conversion Operations*, provides the rationale and justification for the recommended authorized limits, explains how compliance with DOE release requirements will be demonstrated, and shows that the recommended limits are protective and as low as reasonably achievable (ALARA). The document was approved by UDS and submitted to the DOE for final approval. DOE granted approval in October 2005.

2. SALE OF AQHF - ROLES AND RESPONSIBILITIES

In May, 2006, DOE granted approval for UDS to enter into a contract with Solvay Fluorides for disposition of the hydrofluoric acid produced at both conversion facilities. Per the contract, UDS and Solvay have agreed to various responsibilities. In addition, per the ALARA study and DOE O 5420.80A, DOE has certain responsibilities to ensure the UDS produced hydrofluoric acid is compliant. These responsibilities are summarized in this section.

2.1 UDS

UDS shall:

- Sell a minimum sales volume of 100 million pounds to Solvay.
- Provide Solvay with quarterly production forecasts.
- Provide a Certificate of Analysis with each shipment and compare quality to the contract specifications stated in Section A.A and certify that product meets DOE license specifications.
- Perform statistical quality control data on sales of the HF annually and maintain all samples from each lot for three months.
- Assure Solvay equipment is not damaged while the equipment is in UDS' possession. If the equipment is damaged at the fault of UDS, UDS is responsible for all repairs.
- Provide prompt notification to Solvay if the HF production may decrease below 4.7 million pounds from the Portsmouth Conversion Facility and/or 6.2 million pounds from the Paducah Conversion Facility over a ninety day period.

2.2 SOLVAY

Solvay shall:

- Maintain sufficient fixed tank storage or rolling stock to accommodate the full production of both conversion facilities.
- Arrange means of the shipment transportation and routing. Solvay is solely responsible for the HF once loaded into the transportation conveyance.
- Comply with all regulations governing the transportation, handling and storage of the HF.

2.3 DOE

DOE shall:

- Prepare and implement an independent verification program for free release of the HF.

3. REQUIREMENTS

3.1 DOE O 430.1B

DOE O 430.1 B, Real Property Asset Management, establishes the requirements for DOE contractors whose responsibilities include the acquisition, management,

maintenance, disposition, or disposal of real property assets. The contractors requirement document details requires the development of a disposition plan that identifies, assesses, and evaluates alternatives and integrates environmental, safety, and health requirements into the disposition activities.

3.2 29 CFR 1910.119

29 CFR 1910.119 details the OSHA regulations for the management of hazards associated with highly hazardous chemicals and established a comprehensive management program that integrated technologies, procedures, and management practices. The comprehensive management program is referred to as Process Safety Management which is detailed in Section 4 of this plan. Implementation of these requirements is very similar to the DOE DSA and TSR requirements.

4. PROCESS SAFETY MANAGEMENT

4.1 PROCESS SAFETY INFORMATION – MSDSS, ETC.

A Material Safety Data Sheet (MSDS) is maintained by Solvay and is readily available on their website. In addition, a copy of a MSDS for aqHF is available on Documentum and kept in the control room of the conversion facilities for immediate access.

Information on the technology and equipment of the process is maintained by engineering and is documented in *System Description Document (SDD) for the HF Storage System*, DUF6-G-G-SDD-HFS. Information that can be found in the SDD includes the following:

- Simplified process flow diagram
- Maximum intended inventory
- Safe upper and lower limits for pressures and flows
- An evaluation of the consequences of deviations, including those affecting the safety and health of employees
- References piping and instrument diagrams
- Electrical classification
- Relief system design and design basis
- Ventilation system design
- Design codes and standards employed

- Material and energy balances
- Safety systems (interlocks, detection, suppression systems)

4.2 HAZARD ANALYSIS

The hazard analysis (HA) systematically identifies and assesses the hazards associated with the Conversion Facility activities. It includes identification of potential events, the risks associated with those events, and the identification of facility features that can prevent and/or mitigate these events. The accident analysis (AA) further evaluates those events whose consequences could exceed guidelines, and identifies the safety controls to prevent and/or mitigate each event. Based on these evaluations, active and passive safety structures, systems, and components, programs and operator actions are selected as safety controls for additional special design emphasis and evaluation. The hazard evaluation is presented in Section 3.3 and the accident analysis is described in Section 3.4 of the conversion facilities DSAs. Detailed descriptions of the controls are provided in Chapter 4, Selected Safety Structures, Systems, and Components of the conversion facilities DSAs.

The HA performed for the conversion facilities provides a thorough evaluation of the risks to the public, workers, and the environment that might result from accidents involving the hazards identified for the facilities. The HA includes hazard identification and hazard evaluation. Hazard identification is a systematic identification of the hazardous materials and/or energy sources associated with the conversion facility activities that can affect the public and/or workers. The hazard evaluation is used for identification of potential accidents involving the identified hazards and their consequences. A primary output of the hazard evaluation is the identification of preventive and mitigative features applicable to these postulated accident scenarios. These accidents can be binned in accordance with predefined consequence and likelihood ranking thresholds to determine the overall unmitigated risk associated with conversion facility activities, as well as the need for further detailed accident analysis. The HA topics of hazard identification, facility hazard categorization, and hazard evaluation are documented in this conversion facility DSAs.

The method used to identify the hazards is the process safety hazard identification method derived from [American Institute of Chemical Engineers] AIChE Guidelines for Hazard Evaluation Procedures. This method systematically identifies the hazards associated with a process element or activity. The objective of the method is to identify unusual materials and energy sources requiring further analysis, and screen from further consideration those standard industrial or insignificant hazards. If the hazards identified by the process safety hazard identification method are not considered standard industrial or insignificant hazards, those hazards receive a more in-depth, consequence-based hazard evaluation.

Hazard Identification is divided into several steps: (1) division of the facility into "facility areas", (2) completion of Hazardous Identification tables, and (3) screening for Standard Industrial Hazards (SIHs), or insignificant hazards.

The hazard analysis shall be updated and revalidated at least every five years to ensure the hazard analysis is consistent with the current process.

4.2.1 Operating procedures

All tasks are completed either by utilizing approved procedures per UDS-U-QAP-0003, *Procedure System*, or work packages per UDS-U-GFP-0108, *Work Control Process*. The approved work instruction details the steps for each operating phase and the operating limits.

Additional procedures are in place for implementation of safe work practices to provide for the control of hazards during work activities such as LOTO, confined space entry, opening process equipment or piping, control over entrance into a facility by maintenance, contractor, laboratory, or other support personnel.

4.2.2 Employee Participation

Integrated Safety Management System (ISMS) Plan for Operations, DUF6-UDS-PLN-040, refers to the requirements documents of Nuclear Safety Management, 10 CFR 830; and Integration of Environment, Safety, and Health into Work Planning and Execution, 48 CFR 970.5204-2. UDS embraces the eight guiding principles of ISMS that include:

- Line management's responsibility for safety
- Clear roles and responsibilities
- Competence commensurate with responsibility
- Balanced priorities
- Identification of safety standards and requirements
- Hazard controls tailored to the work being performed
- Operations authorization
- Worker Involvement
- UDS also embraces the five core functions of ISMS that include:

- Defining the scope of work
- Analyzing the hazards
- Developing and implementing hazard controls
- Performing work within controls
- Providing feedback and continuous improvement

The UDS ISMS plan reflects the team's approach to demonstrating the integration of safety into all relevant aspects of design, work planning, performance, assessment, and continuous improvement. More specifically, related systems and processes will be implemented through our established ISMS program to ensure that:

- Safety issues, activities, and initiatives are effectively identified, coordinated, and integrated
- Work processes and management systems are used to accomplish work adequately and integrate safety
- Expectations and requirements are included in work directives agreements, and subcontracts are properly interpreted, integrated, and consistently applied
- Workers, managers, and subcontractors are fully aware of their roles, responsibilities, and authorities for safety and are held accountable through formal performance review mechanisms
- Safety risks and vulnerabilities are identified, communicated, and appropriately incorporated into the project budget and work planning process
- Workers are meaningfully involved in safety performance and work control planning processes to better ensure that job-specific hazards are identified and appropriate controls are implemented
- Lessons learned from previous activities are appropriately included in the planning process to continuously improve future work performance

Additionally, this ISMS plan explains the UDS quality assurance program's approach to implementing a strong safety posture within the requirements of the project and without compromise to safety objectives.

4.3 TRAINING

4.3.1 Initial Training

All employees shall attend initial classroom training in an overview of the conversion process. Employees performing work or responsible for maintaining the on-going integrity of the process equipment within the HFS are qualified for each task which may include demonstration of performing the work in compliance with the operating procedures. These operations or tasks include shutdown, startup, maintenance, and normal safe work practices utilized in the HFS.

4.3.2 Refresher Training

In compliance with DOE O 5420.2a, operators shall be requalified to a task every two years. Refresher training will be performed at least every three years for any additional training not directly associated with a task, as applicable.

4.3.3 Training Documentation

Training records are managed in compliance with UDS-U-TRN-1001, *Training*. Records at a minimum contain the identity of the employee, the date of training, and how the employee demonstrated an understanding of the training. Records are retained in compliance with UDS-U-DMP-002, *Records Management Program*.

4.4 SUBCONTRACTORS

As a part of their subcontract requirements, subcontractors are responsible for ensuring the competence of personnel performing work under their contract and ensuring their personnel are trained and/or qualified for the assigned position. UDS provides a flow down of the training and qualification requirements to the subcontractor using specific subcontract language in purchase agreements and the training programs are audited before work begins and periodically thereafter. UDS requires the subcontractor to maintain records of their training programs that meet the specifications detailed in the subcontract.

Subcontractor personnel shall meet the qualification requirements for the job function to be performed. UDS may utilize staff augmentation and subcontractors. In the case of staff augmentation personnel, each person is required to meet the requirements of the applicable assigned function as described on the specific Task-to-Training Matrix, training database, or other applicable training documents for that position. In the case of subcontractor personnel, UDS will evaluate the subcontractor as to whether the qualifications specified in the applicable subcontract for the function to be performed are met and whether additional applicable regulatory requirements are required to be met.

In addition, the UDS management/supervision chain of command will oversee the work performed by the subcontractor and all subcontractor personnel will be required to meet site access training requirements for the specifically classified area where the work will be performed.

4.4.1 UDS responsibilities

Prior to allowing any contractors to perform work within the UDS facilities, the contractor's safety performance and programs are evaluated to ensure they meet the UDS expectations for safe work practices. UDS shall provide the appropriate system specific training to ensure that contract employees are familiar with the release hazards related to the work to be preformed and the process, the emergency action plan, safe work practices to control the presence, entrance, and exit of contract employers. In addition, UDS will maintain a contract employee injury and illness log related to the contractors work in the HFS.

4.5 PRE-START SAFETY REVIEW

HF operations will be reviewed as part of the readiness program, and specifically address in the ORR process. Prior to the introduction of aqHF to process, this review shall confirm and document the following:

- Construction and equipment are in accordance with design specifications
- Safety, operating, maintenance, and emergency procedures are in place and are adequate
- PHA has been performed for new facilities and recommendations have been resolved or implemented before startup, and modified facilities meet the management of change requirements
- Training of each employee involved in operating a process has been completed.

4.6 MECHANICAL INTEGRITY

Initial testing, in-service surveillance and maintenance activities are described in detail in Chapter 10 of DUF6-UDS-PLN-037, *Safety Management Program Descriptions*.

The maintenance program is developed and implemented to ensure that maintenance activities are conducted to preserve and restore the availability, operability, and reliability of SSCs important to operation of the facility. Site and facility procedures address the elements of DOE Orders 430.1B and 433.1, maintenance activities such as training of maintenance personnel, maintenance of facilities and equipment, post maintenance testing, control and calibration of measuring equipment, generation of

work orders, tracking and scheduling preventive maintenance, and maintenance history and trending.

Tests that verify conformance, test requirements, and acceptance criteria are formally defined by the organization requesting testing. The test requirements and acceptance criteria are based on specified requirements contained in design or other pertinent technical documents approved by the organization responsible for the design of the item (e.g., engineering specifications, purchase requisitions, test plans or a combination of documents). Test requirements and acceptance criteria are identified and documented to ensure that test results verify design requirements for operability, as opposed to verifying the acceptability of performed work. Post-modification testing must demonstrate that the original problem was corrected and no new problems were created.

Engineers and Subject Matter Experts (SMEs) provide technical support to Facility Managers by providing input during the development of operating, maintenance, and test plan procedures. The engineer or SME uses DSAs, TSRs and System Description Documents to help provide technical support and operability determination functions.

Additional in-service surveillance is performed as part of the UDS maintenance program. Maintenance activities, including surveillance associated with TSRs, is a planned and scheduled in a manner that provides a proper balance of corrective and preventive maintenance.

Procedures address provisions for testing, calibration, and control of test equipment, trending of surveillance results, programmatic reviews, and training of personnel performing surveillances.

4.7 HOT WORK PERMIT

UDS-SHP-801, *Hot Work*, details the use of permits issued for hot work operations conducted on or near the HFS. Permits document the fire prevention and protection requirements, the date authorized for hot work and identify the object on which hot work is to be performed. Permits are kept on file until completion of hot work.

4.8 MANAGEMENT OF CHANGE

UDS-U-PEP-1010, *Control and Tracking of Temporary Modifications,* describes the responsibilities, requirements, and control of performing temporary modifications to ensure that systems, structures, and components (SSCs) fulfill their design function.

4.9 INCIDENT INVESTIGATION

UDS-U-QAP-0029, *Initial Event Report*, requires employees to immediately notify their supervisor of any accident, civil disturbance, environmental issue, event or release. After filing the report, all events are further evaluated and investigated as needed.

4.10 EMERGENCY PLANNING AND RESPONSE

The Emergency Management Program (EMP) for each site is developed from a spectrum of emergencies identified through the Emergency Planning Hazard Assessment (EPHA) process. The EPHAs identify, evaluate, and select the range of initiating events for emergencies for workers, the public, and environment, forming the bases for each site EMP. This process ensures that the emergency preparedness planning performed for each site adequately encompasses the postulated facility events. This section summarizes the evaluated emergency categories incorporated into each of the site-specific EMPs.

The postulated event analyses identified credible scenarios leading to potential releases of radioactive and non-radioactive hazardous materials stored or used that could affect facility and co-located workers, the public, and the environment. Other occurrences that necessitate response under the EMPs include scenarios involving industrial accidents, equipment failures, operational errors, natural phenomena, security-related initiators, and off-site events such as major highway or rail accidents that create emergency conditions onsite.

UDS utilizes DUF6-UDS-PLN-044, *Paducah Emergency Management Plan* and DUF6-UDS-PLN-045, *Portsmouth Emergency Management Plan* for emergency preparedness planning at each site through a coordinated team effort by UDS and USEC. Surveys, assessments, and readiness assurance plans are developed and conducted by UDS. Facility drills and exercises are conducted by USEC with input by UDS. The administration of the site emergency management plan, as it pertains to UDS, will be identified in facility-specific procedures UDS-U-SHP-0304, *Paducah Personnel Protective Action* and UDS-U-SHP-0303, *Portsmouth Facility Employee Emergency Action Plan*.

USEC is required to provide site-wide emergency response services to DOE Contractors operating at the Portsmouth and Paducah reservation pursuant to Appendix F of the Lease Agreement.

4.11 COMPLIANCE AUDITS

An independent assessment per UDS-U-QAP-0012, *Independent Assessments*, will be performed on the HF Disposition Plan and its PSM at least every three years. The assessment will be conducted by at least one person knowledgeable in the process and a report of the findings of the audit will be developed and documented noting

deficiencies that have been corrected. The two most recent compliance audit reports will be kept on file in compliance with UDS-U-DMP-0002, *Records Management Program*.

4.12 TRADE SECRETS

There is no trade secrets within the HFS nor associated with the product aqHF.

5. CERTIFICATION

5.1 SAMPLING AND ANALYSIS

Upon filling a 10,000 gallon tank of HF, a samples will be obtained in accordance with UDS procedures. The samples will be sent for analysis to ensure the HF is within the specification required by contract and full meets the requirements for unrestricted use noted in the ALARA study. The primary laboratory to be used for this analysis is the USEC laboratory co-located within the DOE reservations to the conversion facilities.

Samples will be maintained for ninety days prior to disposal of the unused portions. This will ensure that if needed verification could be performed.

All HF data will be maintained within the analytical data management system. The data quality objects, assessment, verification, and validation requirements will be set within the HF sampling procedure (TBD).

Upon review and acceptance of the sampling and analysis, a certification of analysis (CoA) will be prepared by UDS and submitted to Solvay for approval. Solvay will utilize the information on the CoA for generating the shipping documentation.

5.2 DOE INDEPENDENT VERIFICATION

TBD

6. TRANSPORTATION

6.1 SHIPPING DOCUMENTATION

Solvay is responsible for providing all shipping documentation. UDS will provide to Solvay the COA for each batch of HF to be shipped. UDS will provide the weights/volumes of HF and the transport unit number to Sovay for generating shipment documentation. The shipment paperwork will be provided to UDS personnel for review. If the aqHF is to be transported by truck, UDS personnel shall act as a handoff of the paperwork to the truck driver. If the aqHF is to be transported by rail, Solvay is solely

responsible for providing all necessary paperwork to the railroad. Solvay will provide UDS copies of all rail bills of lading to be maintained in project record files.

6.2 TRANSPORT VEHICLE AND EQUIPMENT INSPECTION

Solvay is responsible for ensuring that all rolling stock meets the applicable DOT requirements. UDS shall perform an inspection on transport vehicle and equipment as a best management practice and in accordance with UDS Procedure (TBD), Truck Inspections and UDS-U-WMP-2006, *UDS Railcar Inspections*. In addition, after loading of the aqHF, the tankers will be inspected again and a tamper indicating device will be applied as necessary. The release of the shipment will be managed in accordance with aqHF shipments (TBD).

6.3 SHIPMENT TRACKING

Solvay is responsible for offsite transportation. Solvay tracks tank cars using commercial railcar tracing programs. Solvay uses QUAL COM® satellite system for tracing tanker trucks.

6.4 EMERGENCY RESPONSE

Solvay is the transporter/consignor for all HF shipments. Once the transport vehicle departs the DOE property, Solvay is responsible for any offsite transportation incidents and implements the following actions to ensure emergency response personnel can safely and efficiently respond to an accident involving aqHF:

Each bill of lading includes the emergency response information

- The carrier is responsible for contacting Solvay in the event of an emergency.
- Solvay maintains a contract with CHEM TREC® for receiving emergency response notifications.
- Solvay provides a product expert for emergency response events.
- Solvay is responsible for all cost associated with emergency response events that are not the result of UDS actions.

7. DATA AND RECORDS

The review, acceptance, distribution, and updating of documents and the identification, collection, indexing, filing, and maintenance of records pertaining to activities associated with the HFS and the PSM is subject to a formal control system. This control system is described in DUF6-UDS-PLN-015, *Document Management Plan*.